Question 6

Correct

Mark 5.0 out of 5.0

Flag question

Histology question

Choose the best correct answer

Are stem cells of skeletal muscle ✓

Are complexes of T tubule and two terminal cisternae ✓

Are only in cardiac and smooth muscle ✓

Are the smooth muscle cells ✓

Layer of connective tissue around the bundle of muscle fibers ✓

The correct answer is:
Satelite cells → Are stem cells of skeletal muscle, Triads → Are complexes of T tubule and two terminal cisternae,

Gap junctions → Are only in cardiac and smooth muscle,

Muscle cells with the ability to synthesis elastic fibers → Are the smooth muscle cells,

Perimysium → Layer of connective tissue around the bundle of muscle fibers

Question 7

Partially correct

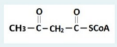
Mark 2.0 out of 5.0

Flag question

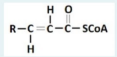
BIOCHEMISTRY question

Metabolism of fatty acids

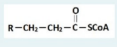
Match the correct characteristic to each of the pictured molecules (you receive 1 point for each correct pair).



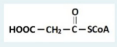
product of the key regulatory reaction of fatty acid synthesis ✗



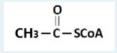
produced in the first oxidation step of beta-oxidation ✓



product of the reaction catalyzed by carnitine acyltransferase II ✓

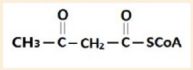


substrate of the key regulatory reaction of fatty acid synthesis ✗

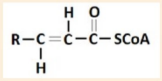


the only product of beta-oxidation entering gluconeogenesis ✗

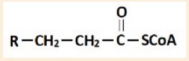
The correct answer is:



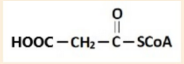
→ in beta oxidation, it is a substrate of the enzyme called thiolase,



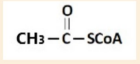
→ produced in the first oxidation step of beta-oxidation,



→ product of the reaction catalyzed by carnitine acyltransferase II,



→ product of the key regulatory reaction of fatty acid synthesis,



→ substrate of the key regulatory reaction of fatty acid synthesis

Question 8

Correct

Mark 5.0 out of 5.0

Flag question

Histology question:

Choose the best correct answer

The thyroid gland has an epithelium organized into [ ] ✓ it is a type of [ ] ✓ . These cells have [ ] ✓ . They secrete their product [ ] ✓ . Blood vessels [ ] ✓

The correct answer is:
Histology question:

Choose the best correct answer

The thyroid gland has an epithelium organized into [follicles] it is a type of [simple cuboidal epithelium]. These cells have [endocrine secretion]. They secrete their product [by basal part to blood vessels]. Blood vessels [are in interstitial connective tissue among follicles]

Question 3

Partially correct

Mark 4.0 out of 5.0

Flag question

Question from histology

Choose the best correct answer

Which cells produce osteoid? [redacted] ✓

The main component of organic extracellular matrix in bone is [redacted] ✓

Which cells are situated in bone lacunas? [redacted] ✓

Which cells can resorb and erode bone matrix? [redacted] ✓

What do the Canaliculi ossium contain? [redacted] ✗

The correct answer is: Which cells produce osteoid? → Osteoblasts, The main component of organic extracellular matrix in bone is → Collagen I, Which cells are situated in bone lacunas? → Osteocytes, Which cells can resorb and erode bone matrix? → Osteoclasts, What do the Canaliculi ossium contain? → Osteocyte processes

Question 4

Complete

Mark 4.5 out of 5.0

Flag question

1) To enable movements of cellular plasma membrane, molecular motors myosins bind to specific cell structures called …….
2) The structure responsible for aligning chromosomes in the equatorial plane during cell division is made up of cytoskeletal fibers and molecular motors. This structure is called……..... The cytoskeletal fibers that create this structure are called…….....
3) In which cells is myosin II the most abundant?
4) Dynein molecular motors are responsible for the movements of cell surface structures called ……....
5) Name four (4) cellular processes in which molecular motors are involved:

[redacted]

Question 5

Correct

Mark 5.0 out of 5.0

Flag question

Genetics

At birth the boy had normal values: weight: 2800 g, size: 48 cm, head circumference: 33 cm, Apgar: 8-9. Physical examination was also normal. None of the boy's relatives were affected by degenerative, chronic, hereditary disease or died unexpectedly. At the age of two years and 10 months, the boy was referred to a pediatric clinic for chronic malnutrition. Doppler ultrasound revealed **hepatosplenomegaly**. The neurologist reported no pathological findings except for a macular **(retinal) cherry red spot.** It was decided to perform an **enzyme activity test, liver and bone marrow biopsies, and molecular genetic testing** because of the high suspicion of [redacted] ✓ disease. Based on the results of the biopsies, a double enzyme assay was performed, and **decreased sphingomyelinase activity** values (0.28 mcoml/L/h) were obtained. The diagnosis was [redacted] ✓ . It belongs to the group of [redacted] ✓ disorders associated with splenomegaly, variable neurological deficit and deposition of [redacted] ✓ and other [redacted] ✓ .

The correct answer is:
Genetics
At birth the boy had normal values: weight: 2800 g, size: 48 cm, head circumference: 33 cm, Apgar: 8-9. Physical examination was also normal. None of the boy's relatives were affected by degenerative, chronic, hereditary disease or died unexpectedly. At the age of two years and 10 months, the boy was referred to a pediatric clinic for chronic malnutrition. Doppler ultrasound revealed **hepatosplenomegaly**. The neurologist reported no pathological findings except for a macular **(retinal) cherry red spot.** It was decided to perform an **enzyme activity test, liver and bone marrow biopsies, and molecular genetic testing** because of the high suspicion of [metabolic storage] disease. Based on the results of the biopsies, a double enzyme assay was performed, and **decreased sphingomyelinase activity** values (0.28 mcoml/L/h) were obtained. The diagnosis was [Niemann-Pick disease]. It belongs to the group of [autosomal recessive] disorders associated with splenomegaly, variable neurological deficit and deposition of [sphingomyelins] and other [lipids].

Question 6

Correct

Mark 5.0 out of 5.0

Flag question

Histology question

Choose the best correct answer

[redacted] Are stem cells of skeletal muscle ✓

[redacted] Are complexes of T tubule and two terminal cisternae ✓

[redacted] Are only in cardiac and smooth muscle ✓

[redacted] Are the smooth muscle cells ✓

[redacted] Layer of connective tissue around the bundle of muscle fibers

Course TEST 2

Status	Finished
Started	Monday, 27 January 2025, 9:08 AM
Completed	Monday, 27 January 2025, 9:50 AM
Duration	41 mins 49 secs
Grade	**49.5** out of 60.0 (**82.5**%)

Quiz navigation

1 2 3 4
8 9 10 11

Show one page at a ti

Finish review

Question 1

Correct

Mark 5.0 out of 5.0

Flag question

Histology question

Choose the best answer for each cell type

- Come from lymphoid progenitor ✓
- Cytoplasmatic granules contain histamin and heparin ✓
- Cytoplasm is filled with hemoglobin ✓
- Differentiate from monocyte ✓
- Originate from polyploid cell ✓

The correct answer is:
B lymphocytes → Come from lymphoid progenitor,
Basophils → Cytoplasmatic granules contain histamin and heparin,
Erythrocytes → Cytoplasm is filled with hemoglobin,
Macrophages → Differentiate from monocyte,
Platelets → Originate from polyploid cell

Question 2

Correct

Mark 5.0 out of 5.0

Flag question

BIOCHEMISTRY question

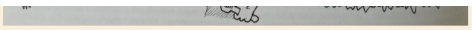
Glycogenoses (glycogen storage diseases, GSD) are inherited metabolic disorders with deficiency of enzyme or transport protein activity that results in either abnormal glycogen structure or excessive glycogen content in tissues. The cause of these diseases is zero or insufficient synthesis of functional proteins (enzymes and transporters) involved in either glycogen synthesis or glycogenolysis.

- Glycogenosis type 0 (aglycogenosis) is caused by a deficiency of a key regulatory enzyme in glycogen synthesis, which is ✓ catalyzing the formation of new ✓ in the existing glycogen chain. The substrate of this enzyme is ✓. An affected individual may suffer severe hypoglycemia, e.g. after an overnight fast, due to insufficient glycogen synthesis ✓.
- Glycogenosis type Ia (von Gierk's disease) is caused by a deficiency of glucose-6-phosphatase, which catalyzes ✓ of glucose-6-phosphate. In the fasting state, it manifests as severe ✓, as glucose cannot be released ✓ into the bloodstream in this disorder.
- Glycogenosis type V (McArdler´s syndrome) is manifested by increased muscle glycogen content and transient muscle weakness and cramping during exercise. The deficiency affects muscle ✓, which normally catalyzes the cleavage of ✓ in muscle glycogen.
- Glycogenosis type III (Cori's disease) is caused by a disorder of the so-called debranching enzyme, whose hydrolase activity releases ✓ from glycogen. A disturbance in the activity of this enzyme leads to the accumulation of glycogen with an abnormal structure.

The correct answer is:
BIOCHEMISTRY question

Glycogenoses (glycogen storage diseases, GSD) are inherited metabolic disorders with deficiency of enzyme or transport protein activity that results in either abnormal glycogen structure or excessive glycogen content in tissues. The cause of these diseases is zero or insufficient synthesis of functional proteins (enzymes and transporters) involved in either glycogen synthesis or glycogenolysis.

- Glycogenosis type 0 (aglycogenosis) is caused by a deficiency of a key regulatory enzyme in glycogen synthesis, which is [glycogen synthase] catalyzing the formation of new [alpha (1→4) glycosidic bonds] in the existing glycogen chain. The substrate of this enzyme is [UDP-glucose]. An affected individual may suffer severe hypoglycemia, e.g. after an overnight fast, due to insufficient glycogen synthesis [in the liver].
- Glycogenosis type Ia (von Gierk's disease) is caused by a deficiency of glucose-6-phosphatase, which catalyzes [dephosphorylation] of glucose-6-phosphate. In the fasting state, it manifests as severe [hypoglycemia], as glucose cannot be released [from liver, kidneys and enterocytes] into the bloodstream in this disorder.
- Glycogenosis type V (McArdler´s syndrome) is manifested by increased muscle glycogen content and transient muscle weakness and cramping during exercise. The deficiency affects muscle [glycogen phosphorylase], which normally catalyzes the cleavage of [alpha (1→4) glycosidic bonds] in muscle glycogen.
- Glycogenosis type III (Cori's disease) is caused by a disorder of the so-called debranching enzyme, whose hydrolase activity releases [free glucose] from glycogen. A disturbance in the activity of this enzyme leads to the accumulation of glycogen with an abnormal structure.



The process of ATP synthesis shown on the picture is localized in cells in [mitochondria] and the energy for this ATP synthesis comes from the proton gradient created by enzymes of the [electron transport chain].

ATP is synthesized in cells also in [glycolysis] by the process called [substrate level phosphorylation].

In the metabolism of amino acids, ATP is consumed in the reaction catalyzed by [glutamine synthetase]. The metabolic pathway called ornithine cycle requires ATP in reactions whose products are [carbamoyl phosphate and argininosuccinate].

ATP is also essential for an active transport of ions through membranes, for example Na/K-ATPase consumes ATP when transporting [3 Na+ outside and 2 K+ into] the cell.

Another consumption of ATP in cells is by motor proteins, for example in muscles the ATP binds to [myosin] and then it is hydrolyzed to ADP and phosphate.

Anabolic pathways also require ATP, for example the enzyme [acetyl-CoA carboxylase] consumes ATP when catalyzes the regulatory reaction of [fatty acid] synthesis.

Question 11

Partially correct

Mark 2.0 out of 5.0

Flag question

Histology question

Choose the best correct answer

Connective tissue in the umbilical cord is [redacted] ✗ .

It consists of:

[redacted] ✗ .

Reticular connective tissue is produced by reticular connective tissue cells ✓ .

This tissue is composed mainly of collagen III ✓ .

What is TRUE for brown adipose tissue

it does not contain blood vessels

✗ .

The correct answer is:
Histology question

Choose the best correct answer

Connective tissue in the umbilical cord is [Wharton's jelly].

It consists of: [abundant content of hyaluronan, collagen fibres and fibroblasts].

Reticular connective tissue is produced by [reticular connective tissue cells].

This tissue is composed mainly of [collagen III].

What is TRUE for brown adipose tissue [brown adipocytes are multilocular].

Question 12

Partially correct

Mark 4.5 out of 5.0

Flag question

BIOCHEMISTRY question

Symptoms of Wernicke-Korsakoff syndrome (WKS) become apparent after moderate stress that does not affect normal individuals. This syndrome is associated with an anomaly in transketolase. The dysfunction of transketolase may be related to a thiamin deficiency, since transketolase utilizes thiamin pyrophosphate (TPP) as a cofactor. The syndrome presents as a mental disorder, with memory loss and partial paralysis, and can become manifest in alcoholics, among other things also because their diet may be vitamin deficient.

Explain details related to the above text: select the BEST options

Transketolase is an enzyme of pentose cycle ✓ in which it catalyzes a transfer of 2-carbon fragments ✓ . An example of such a reaction is the conversion of xylulose-5-phosphate to glyceraldehyde-3-phosphate ✓ .

Thiamin is vitamin B1 ✓ that is one of water soluble ✓ vitamins essential in the diet.

Other use of this vitamin is in aerobic glucose oxidation because TPP acts as a cofactor of aldolase ✗ as well as a cofactor of one of the Krebs cycle enzymes: alpha-ketoglutarate dehydrogenase ✓ .

In the Krebs cycle, TPP is used in the oxidative decarboxylation of the keto-acid called alpha-ketoglutarate ✓ to form succinyl-CoA ✓ .

The WKS presents as a mental disorder the most probably due to the fact that the brain is glucose dependent ✓ for its ATP production.

The correct answer is:
BIOCHEMISTRY question

Symptoms of Wernicke-Korsakoff syndrome (WKS) become apparent after moderate stress that does not affect normal individuals. This syndrome is associated with an anomaly in transketolase. The dysfunction of transketolase may be related to a thiamin deficiency, since transketolase utilizes thiamin pyrophosphate (TPP) as a cofactor. The syndrome presents as a mental disorder, with memory loss and partial paralysis, and can become manifest in alcoholics, among other things also because their diet may be vitamin deficient.

Explain details related to the above text: select the BEST options

Transketolase is an enzyme of [pentose cycle] in which it catalyzes a transfer of [2-carbon fragments]. An example of such a reaction is the conversion of xylulose-5-phosphate to [glyceraldehyde-3-phosphate].

Thiamin is vitamin [B1] that is one of water [soluble] vitamins essential in the diet.

Other use of this vitamin is in aerobic glucose oxidation because TPP acts as a cofactor of [pyruvate dehydrogenase complex] as well as a cofactor of one of the Krebs cycle enzymes: [alpha-ketoglutarate dehydrogenase].

In the Krebs cycle, TPP is used in the oxidative decarboxylation of the keto-acid called [alpha-ketoglutarate] to form [succinyl-CoA].

The WKS presents as a mental disorder the most probably due to the fact that the brain [is glucose dependent] for its ATP production.

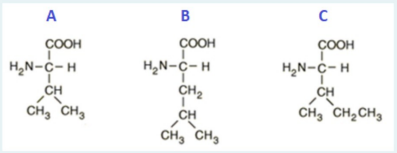
Question 9

Partially correct

Mark 3.5 out of 5.0

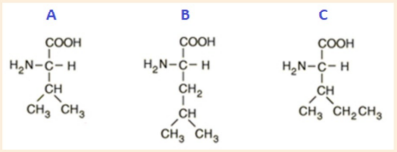
Flag question

BIOCHEMISTRY question



The figure shows the structure of [ ] ✓ amino acids, from which the molecule "A" is called [ ] ✓ . An excess of ALL these molecules taken with diet is metabolized mainly in [ ] ✗ to [ ] ✓ . The first reaction of this catabolism requires vitamin [ ] ✗ and an enzyme that is one of [ ] ✓ . The next step of degradation of these molecules is catalyzed by an enzyme whose inherited deficiency is called [ ] ✓ . In case of no enzyme deficiency, the molecules A and C are metabolized up to methylmalonyl-CoA that is further isomerized to [ ] ✓ . This reaction requires a [ ] ✗ derivative as an enzyme cofactor. The final degradation product of the molecule B is [ ] ✓ .

The correct answer is:
BIOCHEMISTRY question



The figure shows the structure of [essential proteinogenic] amino acids, from which the molecule "A" is called [valine]. An excess of ALL these molecules taken with diet is metabolized mainly in [skeletal muscles] to [alpha-keto acids]. The first reaction of this catabolism requires vitamin [B6] and an enzyme that is one of [transferases]. The next step of degradation of these molecules is catalyzed by an enzyme whose inherited deficiency is called [leucinosis]. In case of no enzyme deficiency, the molecules A and C are metabolized up to methylmalonyl-CoA that is further isomerized to [succinyl-CoA]. This reaction requires a [cobalamin] derivative as an enzyme cofactor. The final degradation product of the molecule B is [acetyl-CoA].

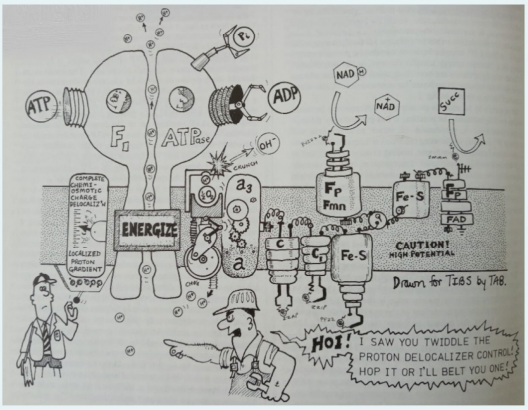
Question 10

Partially correct

Mark 4.0 out of 5.0

Flag question

BIOCHEMISTRY question



The process of ATP synthesis shown on the picture is localized in cells in [ ] ✓ and the energy for this ATP synthesis comes from the proton gradient created by enzymes of the [ ] ✓ .

ATP is synthesized in cells also in [ ] ✓ by the process called [ ] ✓ .

In the metabolism of amino acids, ATP is consumed in the reaction catalyzed by [ ] ✗ . The metabolic pathway called ornithine cycle requires ATP in reactions whose products are [ ] ✓ .

ATP is also essential for an active transport of ions through membranes, for example Na/K-ATPase consumes ATP when transporting [ ] ✓ the cell.

Another consumption of ATP in cells is by motor proteins, for example in muscles the ATP binds to [ ] ✓ and then it is hydrolyzed to ADP and phosphate.